Amendments to the Specification

Please amend the specification as follows with respect to the paragraph numbers used in the present Specification represented in US Publication No. 2006/0159123.

Please make the indicated changes to paragraphs 0020-0023, 0026, 0028-0031, and 0033-0038 as follows:

[0020] According to the present exemplary embodiment of the invention, the nodes of the network can each reserve a fraction of the bus bandwidth. In the example illustrated in the table of item 2 of FIG. 1, the node A has reserved 10 Mb per second, the node B has reserved 20 Mb per second, the node D has reserved 30 Mb per second and the node C has reserved 40 Mb per second. The information indicative of the fraction of bandwidth reserved by each node is collected by a master node of the network, in this case node A, and is stored in a table [[1]] of item 2 mapped with the physical network addresses of the nodes. The physical addresses of the network nodes A, B, C and D are respectively represented by ~~MACA, MACB, MACC and MACD~~ MAC A, MAC B, MAC C, and MAC D, and the logical network addresses of the nodes are respectively represented by ~~ID0, ID1, ID2, ID3~~ ID 0, ID 1, ID 2, and ID 3. These logical addresses are used in the network messages to circulate the token.

[0021] On the basis of the table [[1]] of item 2, the master node A constructs, in a table [[3]], in the form of a list, such as in item 3 of FIG. 1, a sequence defining the chronological order of passage of the token between all the nodes in such a way that the predetermined fraction of the bandwidth reserved for each node of the network during a cycle corresponds in the sequence to a certain number of occurrences of passage of the token by the node concerned.

[0022] The sequence defining the chronological order of passage of the token can be constructed by the master node A using a greater common divisor calculation between the reserved bandwidth fractions. In the example of FIG. 1, the total available bandwidth is 100 Mb per second. The greater common divisor is 10 Mb per second. On this basis, the sequence defining the chronological order of passage of the token will include one passage occurrence for the node A, two passage occurrences for the node B, three passage occurrences for the node D and four passage occurrences for the node C. These passage occurrences are symbolized in the table of item 3 by the logical addresses ~~ID0, ID1, ID2 and ID3~~ ID 0, ID 1, ID 2, and ID 3 of the nodes.

[0023] Moreover, the occurrences of passage of the token by a node of the network can advantageously be distributed evenly in the sequence among the occurrences of passage of the token by the other nodes of the network, for example using the Bellman algorithm, as illustrated in the table of item 3 in FIG. 1. This distribution can be used to avoid jitter effects.

[0026] When the Ethernet bus is initialized, one or more nodes of the network must be configured as master nodes of the network. On receipt of an initialization network message sent from one of the nodes of the network, each node configured as a master node sends over the Ethernet bus 1 a first network message containing the physical address of the node. These first network messages are sent over the bus 1 from each node with a limited random delay. When the maximum delay for transmission of the first network message expires, the node configured as a master node which has the highest physical address is determined by default as the master node of the network. In the example of FIG. 2, the master node of the network is the node A, the physical address of which is represented by ~~MACA~~ MAC A.

[0028] The master node of the network sends over the bus 1 a second network message to announce to the other nodes of the network that it is the master node and that it has a logical address, in this case represented by ~~ID0~~ ID 0. When the second network message is received by all the other nodes of the network, each other node of the network returns over the bus 1 a third network message M3 containing the physical address of the node, for example ~~MACB~~ MAC B for the node B, and, optionally, information indicative of the fraction of bandwidth reserved by the node, for example 20 Mb per second for the node B. To avoid collisions of Ethernet network messages on the bus 1, the time interval between the moment of receipt of the second network message in a node and the moment of transmission of the third network message M3 is a limited random delay of maximum value T1. If a node of the network does not receive a fourth message M4 from the master node before the delay T1 counted from the moment of receipt of the second network message, it again immediately returns a third network message M3 over the bus as illustrated in the FIG. 2 for the node C.

[0029] In response to the receipt of a third network message M3, the master node A returns to the sending node, for example the node B, the fourth network message M4 comprising the logical address assigned to the node, for example ~~ID1~~ ID 1 for the node B. The master node increments the logical addresses assigned to the nodes of the network as it receives the third network messages M3.

[0030] This process of numbering of the nodes of the network by interchanges of third and fourth network messages M3, M4 is represented by the part I of the timing diagram. At the same time that the fourth network messages M4 are sent over the bus 1, the master node A constructs the association table [[1]] of item 2 containing, for each node of the network, the physical addresses ~~MACA, MACB, MACC, MACD~~ MAC A, MAC B, MAC C, MAC D, and logical addresses ~~ID0, ID1, ID2, ID3~~ ID 0, ID 1, ID 2, ID 3 of the node and the information indicative of the fraction of bandwidth reserved by the node.

[0031] After a delay equivalent to two times the delay T1, counted from the moment of transmission of the second network message, the master node A constructs the table of item 3 containing the sequence defining the chronological order of circulation of the

token between the nodes of the network as indicated above and transmits it to each node of the network.

[0033] Each node that holds the token can write an Ethernet packet once to the bus 1, then transfers the token to a next node and so on according to the chronological order defined in the table of item 3. To control the circulation of the token from node to node, fifth network messages M5 and sixth network messages M6 are interchanged between the nodes of the network. In the token circulation mechanism according to an exemplary embodiment of the invention, the master node A, with logical address ~~ID0~~ ID 0, always has the token first and can write to the bus 1 as symbolized by the reference W in the FIG. 2. It then sends the token to the next node in the sequence, which is the node D with logical address ~~ID2~~ ID 2 via a fifth network message M5. The fifth message M5 is an Ethernet transmission message received by all the nodes of the network to enable them to follow in parallel the circulation of the token in their table of item 3. On receipt of the fifth network message, the node D returns over the bus 1 the sixth network message as an acknowledgement for the node A. This process continues thus from node to node according to the chronological order defined in the table of item 3.

[0034] Now, if, after a delay T2 counted from the moment of transmission of the fifth network message M5 from a node of the network, no sixth message M6 is sent over the bus, the node in question again returns the sixth network message M6 as illustrated for the node C in FIG. 2. If no sixth network message M6 is sent over the bus 1 within the delay T2 as indicated above, the current node having the token, for example the node C in FIG. 2, sends over the bus 1 a seventh network message M7 indicating that the next node in the sequence is no longer available, in the example, the node B with logical address ~~ID1~~ ID 1, and containing the logical address of the new next node in the sequence, in this case the node D with logical address ~~ID2~~ ID 2. In response to the receipt of the seventh network message M7, the other nodes of the network update the table of item 3 by deleting the occurrences of passage of the token by the failed node, in the example, the occurrences symbolized by ~~ID1~~ ID 1. The current node having the token then sends a fifth network message M5 containing the logical address of the new next node to continue the token circulation mechanism.

[0035] In the case where the failed node is the master node, the current node sends over the bus a network initialization message which triggers the election of a new master node and the construction of a new table for item 3 according to the same principle illustrated by the part I of the timing diagram.

[0036] After having sent its data, and before passing the token, a node can send to the master node a message M3 to change its bandwidth reservation. The master node returns a message M9 indicating either that the reservation has been successful or that it has failed (if, for example there is not enough available bandwidth left). If the reservation is accepted, the master node modifies its ~~list~~ table of item 2. The next time

the cycle passes via the master node, the latter updates the ~~list~~ table of item 3 and transmits it over the network before recommencing a cycle. It should be noted that a certain percentage of the bandwidth must be kept in reserve as a safety margin to ensure that the algorithm for calculating the list for the passage of the token is executed correctly, given the approximations made to map the bandwidth reservation with the number of occurrences of the token. As an example, this percentage may be approximately 10%.

[0037] When the token returns to the first occurrence of the master node in the table of item 3, the master node A recommences the cycle illustrated by part 11 of the timing diagram.

[0038] It is possible to provide for the master node A, before recommencing the cycle illustrated by part 11 of the timing diagram, to cyclically run a procedure to update the tables of items 2 and 3 to take account of the changes of configuration of the network, in particular the connection of new peripheral devices. This update procedure can be carried out with a period T3 very much longer than the delays T1 and T2. According to this update procedure, the master node A sends over the bus an eighth network message M8 enabling the new devices connected to the bus to be identified as a new node of the network as illustrated by the reference E in FIG. 2. Within the delay T2 counted from the moment of transmission of the eighth network message M8, the master node A then waits for the receipt of one or more third network messages M3. FIG. 2 represents, by way of example, the exchange of a third network message M3 and a fourth network message M4 between the master node A and the new node C. Each time a message M3 is received, the time counter is reset. At the end of the delay T2, the master node reconstructs, if there has been a change, a new table for item 3 and transmits it over the bus 1.